

REMARKS

Reconsideration and withdrawal of the rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-4, 8 and 10-17 are now pending in the application, with Claims 1, 2, 8, 10, 12 and 16 being independent. Claims 5-7 and 9 have been cancelled without prejudice. Claims 1, 2, 8, 10 and 11 have been amended and Claims 12-17 have been added herein.

Claims 5, 9 and 10 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants' regard as the invention. Claims 5, 9 and 10 further were rejected under 35 U.S.C. § 101. Without conceding the propriety of these rejections, Applicants have cancelled Claims 5 and 9 and amended Claim 10 to be in a more accepted format. In view of the foregoing, reconsideration and withdrawal of the rejections under 35 U.S.C. § 112, second paragraph, and 35 U.S.C. § 101, are respectfully requested.

Claims 1-11 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,471,757 (Koitaabashi, et al.). This rejection is respectfully traversed.

Applicants' invention as recited in independent Claim 1 is directed to an ink for use in ink jet recording including a dye and a pigment as colorants. The pigment is a self-dispersible pigment in which at least one anionic group is bonded directly or through another atomic group to a surface of the pigment. The dye is an anionic dye, 2-pyrrolidone is further contained as a solvent, and the mass-based content X of 2-pyrrolidone in the ink

and the ratio Y of the pigment to the sum of the dye and the pigment satisfy the following formulas 1 to 3 at the same time:

$$\text{formula 1} \quad 12 \leq X < 30$$

$$\text{formula 2} \quad 50 \leq Y \leq 75$$

$$\text{formula 3} \quad Y \geq -2X + 84.$$

Applicants' invention as recited in independent Claim 2 is directed to an ink for use in ink jet recording including a dye and a pigment as colorants. The pigment is a self-dispersible pigment in which at least one anionic group is bonded directly or through another atomic group to a surface of the pigment. The dye is an anionic dye, 2-pyrrolidone is further contained as a solvent, and the mass-based content X of 2-pyrrolidone in the ink and the ratio Y of the pigment to the sum of the dye and the pigment satisfy the following formulas 1 to 3 at the same time:

$$\text{formula 1} \quad 12 \leq X < 30$$

$$\text{formula 2} \quad 50 \leq Y \leq 75$$

$$\text{formula 3} \quad Y \geq (-4/3)X + 86.$$

Applicants' invention as recited in independent Claim 8 is directed to an ink for use in ink jet recording including a self-dispersible pigment in which at least one anionic group is bonded directly or through another atomic group to a surface of the pigment and an anionic dye as colorants, and 2-pyrrolidone as a solvent. The mass-based content X % of 2-pyrrolidone in the ink and the ratio Y % of the pigment to the sum of the dye and the pigment respectively satisfy $10 < X < 30$ and $50 \leq Y \leq 75$, and the ink has a first-ejection time of 7 seconds or longer as measured with an ink jet head of an ejection amount of 4.5 picoliters.

Independent Claims 10, 12, and 16 are each directed to an ink jet recording method and are based on independent Claims 1, 2, and 8, respectively.

Initially, it should be noted that the ink disclosed in the specification of the present invention can have at least the beneficial effect of improving (extending) a maximum elapsed time, or a first-ejection time, from the end of ejection by the ink ejection unit to a time when a next ejection can still be executed normally. This beneficial effect can be achieved by having the pigment, dye and 2-pyrrolidone satisfy the proportions recited in the independent claims of the subject application.

KoATABASHI et al. is directed to an ink having a dye and a pigment. The pigment is a self-dispersant type pigment and an anionic dye in which at least one anionic group is bound on a surface of the pigment directly or through another atomic group. The pigment is diffused in an aqueous solution such as water, aqueous organic solvent, or a mixture thereof. KoATABASHI et al. discloses dozens of useful solvents, one of which is 2-pyrrolidone. Applicants' submit that there is no teaching or suggestion, in KoATABASHI et al., of the amount of 2-pyrrolidone present in the ink composition, much less the same proportions recited in the independent claims of the subject application. Although KoATABASHI et al., in the examples, does recite amounts of solvent that would overlap Applicants' claimed range, none of the examples use 2-pyrrolidone as the solvent. Applicants' submit that it would not have been obvious to one of ordinary skill in the art to select 2-pyrrolidone from the list of solvents disclosed in the specification of KoATABASHI et al., and use the solvent in the proportions recited in the independent claims of the subject specification.

The Examiner cites MPEP 2144.05 in asserting that it would have been obvious to one of ordinary skill in the art to try to select any portion of the claimed ranges from the ranges disclosed in Koitabashi et al., particularly in view of the fact that “[t]he normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.” In re Peterson, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003). The Examiner, however, has not demonstrated how a specific result, such as improving (extending) a maximum elapsed time, or first-ejection time, from the end of ejection by the ink ejection unit to a time when a next ejection can still be executed normally, is correlated to the amounts of 2-pyrrolidone, pigment, and dye in the ink. Only Applicants’ specification has recognized that the amount of, and relationship between, 2-pyrrolidone, pigment, and dye in the ink can have a beneficial effect, such as improving (extending) a maximum elapsed time, or a first-ejection time, from the end of ejection by the ink ejection unit to a time when a next ejection can still be executed normally.

Therefore, Koitabashi et al. fails to disclose or suggest important features of the present invention recited in independent Claims 1, 2, and 8. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Accordingly, Applicants respectfully submit that the present invention is patentably defined by independent Claims 1, 2, 8, 10, 12 and 16. Dependent Claims 3, 4, 11, 13-15 and 17 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark A. Williamson", with a long horizontal flourish extending to the right.

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